

## **ABSTRACT**

A procedure for designing WDM optical networks provides both working circuits and protection circuits for carrying traffic demands between node pairs. The protection circuits are activated for the purpose of network recovery in case of a fault on a working circuit. Each protection circuit is link-disjoint, and preferably node-disjoint, from its

5 corresponding working circuit. The network is subdivided into logically defined rings, such that each working and protection circuit lies on one or more of the rings. In particular embodiments of the invention, the joint routing of circuits is carried out so as to minimize the total length of the working and protection circuits according to a length that includes a weight for each link. The weight is selected to promote the efficient packing of  
10 optical fibers with wavelength channels.